chemical constituents in the chemical solution to be delivered;

a precision analyzer sample delivery arrangement for delivering to said analyzer a sample of the chemical solution;

a controller for receiving information relative to the determination by said analyzer of the proportion of one of the predetermined chemical constituents in the chemical solution to be delivered;

a replenisher responsive to said controller for dispensing a controlled quantity of the predetermined chemical constituent; and

a purge system for clearing said analyzer and said delivery arrangement.

2. (Amended) The chemical bath control system of claim 1, wherein said analyzer is a titrator system.

3. (Amended) The chemical bath control system of claim 1, wherein said analyzer comprises:

a reaction cell for receiving a sample of the chemical solution from said precision analyzer sample delivery arrangement; and

a sensor for measuring a predetermined characteristic of the chemical solution and the progress of a reaction with the chemical solution.

4. (Amended) The chemical bath control system of claim 3, wherein said reaction cell comprises a glass beaker.

5. (Amended) The chemical bath control system of claim 3, wherein said sensor comprises a pH electrode.

6. (Amended) The chemical bath control system of claim 3, wherein said sensor comprises a ORP electrode.

7. (Amended) The chemical bath control system of claim 3, wherein said sensor comprises an ion selective electrode.

8. (Amended) The chemical bath control system of claim 3, wherein said sensor comprises a turbidity sensor.

9. (Cancelled) The chemical control system of claim 1, wherein the chemical solution is a slurry, and one of the predetermined chemical constituents in the slurry is H202.

10. (Amended) The chemical bath control system of claim 1, wherein there is further provided a global loop for distributing the chemical solution.

11. (Amended) The chemical bath control system of claim 1, wherein said controller is provided with a display for displaying information responsive to the determination made by said analyzer.

12. (Amended) The chemical bath control system of claim 11, wherein said display displays information responsive to a plurality of predetermined parameters of the chemical control system.

13. (Amended) The chemical bath control system of claim 11, wherein said display displays information responsive to a diagnostic condition of the chemical control system.

14. (Amended) The chemical bath control system of claim 11, wherein said display displays information responsive to a history of replenishment operations by said replenisher.

15. (Amended) The chemical bath control system of claim 11, wherein said display displays information responsive to a history of system faults.

16. (Amended) The chemical bath control system of claim 11, wherein there is further provided a chemical sensor, and said display displays information responsive to the

calibration of said chemical sensor.

17. (Amended) The chemical bath control system of claim 11, wherein there is further provided a chemical tank, and said display displays information responsive to the amount of the chemical solution in said chemical tank.

18. (Amended) The chemical bath control system of claim 17, wherein there is further provided a liquid level monitoring arrangement coupled between said chemical tank and said controller.

19. (Amended) The chemical bath control system of claim 18, wherein said liquid level monitoring arrangement comprises a pressure monitoring system for measuring the pressure of a monitoring gas that is delivered to said chemical tank by way of a pressure regulator and orifices, monitoring being effected in a flow region past said orifices within an inert tube that extends into said tank so as to be immersed

20. (Amended) The chemical bath control system of claim 19, wherein the pressure of a monitoring gas that is delivered to said liquid level monitoring arrangement prior to said orifice is approximately between I and 15 psi.

21. (Amended) The chemical bath control system of claim 20, wherein the pressure of a monitoring gas that is delivered to said liquid level monitoring arrangement is preferably between 2 and 10 psi.

22. (Amended) The chemical control system of claim 1, wherein said precision analyzer sample delivery arrangement comprises an eductor for drawing a sample to said analyzer.

23. (Canceled) The chemical control system of claim 1, wherein there is further provided a purge system for clearing said analyzer.

24. (Amended) The chemical bath control system of claim 1, wherein said purge system comprises a gas purge valve for controlling a pressurized purge gas for clearing said analyzer.

25. (Amended) The chemical bath control system of claim 24, wherein said purge system additionally comprises a rinse solvent purge valve for controlling a rinse solvent for clearing said analyzer.

26. (Amended) The chemical bath control system of claim 25, wherein actuation of said rinse solvent purge valve additionally clears an analyzer plumbing associated with said analyzer and said gas purge valve.

27. (Amended) A chemical bath control system for a chemical solution having a predetermined chemical constituent, the chemical control system comprising:

a precision analyzer sample delivery arrangement for delivering a precise sample of the chemical solution;

a reaction cell for receiving the precise sample of the chemical solution;

a precision analyzer reagent delivery arrangement for delivering a precise quantum of a predetermined reagent to said reaction cell;

a sensor for measuring a characteristic of the chemical solution;

a controller for receiving information relative to the characteristic of the chemical solution measured by said sensor;

a replenisher responsive to said controller for receiving a controlled quantity of the predetermined chemical constituent;

a purge system for clearing said analyzer and said delivery arrangement.

28. (Amended) The chemical bath control system of claim 27, wherein there is further provided a second sensor for detecting the availability of the chemical solution.

29. (Amended) The chemical bath control system of claim 28, wherein said second sensor comprises a proximity sensor.

30. (Amended) The chemical bath control system of claim 27, wherein said precision analyzer sample delivery arrangement comprises a syringe.

31. (Amended) The chemical bath control system of claim 30, wherein there is further provided a controllable drive arrangement for driving said syringe.

32. (Amended) The chemical bath control system of claim 31, wherein said controllable drive arrangement comprises a stepper motor drive.

33. (Amended) The chemical bath control system of claim 27, wherein said replenisher is arranged to deliver the controlled quantity of the predetermined chemical constituent to a storage tank of the chemical solution.

34. (Amended) The chemical bath control system of claim 27, wherein there is further provided a cleanup arrangement for clearing said reaction cell of a prior sample of the chemical solution.

35. (Amended) The chemical bath control system of claim 34, wherein said cleanup arrangement comprises a purge gas.

36. (Amended) The chemical bath control system of claim 35, wherein said cleanup arrangement comprises a rinse solvent.

37. (Amended) The chemical bath control system of claim 34, wherein said cleanup arrangement comprises a syringe cycling arrangement for cycling a sample syringe until it is cleared of a prior sample.

38. A method of analysis of a chemical solution in a tank having a first chemical composition, the method comprising the steps of:

delivering a sample of the chemical solution having the first chemical composition

to an analysis cell;

performing a titration analysis on the chemical solution having the first chemical composition that has been delivered to the analysis cell, said step of performing a titration analysis including the further steps of:

controlling a syringe to deliver a titrant to the chemical solution; and

monitoring a predetermined chemical characteristic ofthe chemical solution during performance of said titration analysis;

determining an end point of the titration analysis; and

conducting a cleanup procedure.

39. The method of claim 38, wherein said step of delivering comprises the further step of delivering a predetermined sample quantity of the chemical solution having the first chemical composition to the analysis cell.

40. The method of claim 39, wherein said step of delivering a predetermined sample quantity of the chemical solution having the first chemical composition to the analysis cell comprises the further step of cycling a sample syringe.

41. The method of claim 38, wherein said step of delivering comprises an initial phase of adjusting a rate at which said step of performing a titration analysis is conducted in inverse proportion to a rate of change of a monitoring signal.

42. The method of claim 38, wherein said step of delivering further comprises a final phase wherein a rate of delivery is fixed and slow as the end point of the titration analysis nears.

43. The method of claim 38, wherein said step of delivering comprises the fUrther step of purging from a sample loop all liquid associated with a prior sample.

44. The method of claim 38, wherein said step of delivering comprises the further step of using a continuous pneumatic level sensor for detecting and confirming the

delivery of all reagents including the sample of the chemical solution having the first chemical composition to the analysis cell.

45. The method of claim 44, wherein said step of delivering comprises the fbrther step of timing the delivery Of each chemical solution to the analysis cell, for monitoring adequacy of a reagent supply and equipment operation.

46. The method of claim 38, wherein said step of performing a titration analysis comprises the further step of delivering a conditioning reagent.

47. The method of claim 46, wherein said step of delivering a conditioning reagent comprises the further step of controlling a gravity feed arrangement.

48. The method of claim 46, wherein said step of delivering a conditioning reagent comprises the further step of controlling a pump.

49. The method of claim 38, wherein said step of controlling a syringe to convey a titrant comprises the further step of controlling a stepper drive motor coupled to the syringe.

50. The method of claim 38, wherein said step of analyzing a predetermined chemical characteristic of the chemical solution comprises the further step of taking analog readings of the predetermined chemical characteristic.

51. The method of claim 50, wherein said steps of analyzing a predetermined chemical characteristic of the chemical solution and determining an end point of each titration analysis are repeated.

52. The method of claim 51, wherein said steps of analyzing a predetermined chemical characteristic of the chemical solution and determining an end point of each titration analysis are repeated until repeatability of the result of the titration analysis is

established within predetermined parameters.

53. The method of claim 52, wherein said steps of analyzing a predetermined chemical characteristic of the chemical solution and determining an end point of each titration analysis are repeated between approximately 2 and 9 times.

54. The method of claim 38, wherein said step of conducting a cleanup procedure comprises the further step of forcing a gas purge backward through a filter through which was flowed the chemical solution having the first chemical composition that has been delivered to the analysis cell during performance of said step of delivering a sample.

55. The method of claim 54, wherein there is further provided the step of issuing an error warning if it is determined that the gas pressure during said step of forcing a gas purge is above a predetermined pressure.

56. The method of claim 54, wherein there is further provided the step of propelling a rinse water by means of said purge gas through a filter through which was flowed the chemical solution having the first chemical composition that has been delivered to the analysis cell during performance of said step of delivering a sample.

57. The method of claim 56, wherein said propelled rinse water constitutes a high speed, low volume spray.

58. The method of claim 56, wherein there is further provided the step of stirring a titration vessel to a maximum stirring rate short of causing foaming to optimize titration and stirring.

59. The method of claim 56, wherein there is further provided the step of cycling a sample syringe until it is cleaned.

60. The method of claim 38, wherein prior to performing said step of performing a titration analysis there is provided the step of calibrating a pH electrode.

61. The method of claim 60, wherein said step of calibrating a pH electrode comprises the further steps of:

taking a first pH reading with the pH electrode using a first pH buffer;

taking a second pH reading with the pH electrode using a second pH buffer; and

determining slope and offset values for the pH electrode.

62. The method of claim 38, wherein there is provided an OR.P electrode and said step of performing a titration analysis comprises the step of performing a differential titration analysis.

63. The method of claim 62, wherein prior to performing said step of performing a differential titration analysis there is further provided the step of determining the sensitivity of the ORP electrode.

64. The method of claim 38, wherein said step of determining an end point of the titration analysis comprises the step of determining a turbid end point of the titration analysis, and there is further provided the step of employing a turbidity sensor to determine the turbid end point of the titration.

65. The method of claim 64, wherein said step of performing a titration analysis on the chemical solution having the first chemical composition that has been delivered to the analysis cell comprises the further step of titrating a solution of unknown cyanide concentration.

66. The method of claim 65. wherein said step of titrating a solution of unknown cyanide concentration employs a silver ion.

67. The method of claim 64, wherein said step of employing a turbidity sensor to

determine the turbid end point of the titration comprises the step of determining a change in the rate of change of turbidity of the chemical solution and titrating until the rate falls to the vicinity of zero.

68. A method of analysis of a chemical solution in a tank having a first chemical composition, the method comprising the steps of:

delivering a sample of the chemical solution having the first chemical composition to an analysis cell;

performing an ion selective analysis on the chemical solution having the first chemical composition that has been delivered to the analysis cell, said step of performing the ion selective analysis including the further steps of:

delivering a plurality of predetermined amounts of a standard solution having a known concentration of analyte to the chemical solution having the first chemical composition that has been delivered to the analysis cell; and

measuring an electrode potential value of an ion selective electrode responsive to a predetermined chemical characteristic of the chemical solution having the first chemical composition that has been delivered to the analysis cell after delivering each of the predetermined amounts of the standard solution; and

determining a quantity of an analyte in the chemical solution having the first chemical composition that has been delivered to the analysis cell, said step of determining a quantity of an analyte including the further step of extrapolating a plurality of the measured electrode potential values back to a predetermined point of analyte concentration.

69. The method of claim 68. wherein said step of delivering a plurality of predetermined amounts of a standard solution comprises delivery of approximately between 2 and 6 predetermined amounts of the standard solution.

70. The method of claim 68, wherein said step of delivering a plurality of predetermined amounts of a standard solution having a known concentration of analyte comprises the further step of predetermining the amounts of the standard solution

having the known concentration of analyte whereby in said step of measuring an electrode potential value of an ion selective electrode responsive to a predetermined chemical characteristic of the chemical solution having the first chemical composition that has been delivered to the analysis cell after delivering each of the predetermined amounts of the standard solution, the electrode potential differences between successive one of the measurements is approximately between 3 mV and 40 mV.

71. The method of claim 70, wherein the electrode potential differences between successive one of the measurements is approximately between 5 mV and 30 mV.

72. The method of claim 71, wherein the electrode potential differences between successive one of the measurements is approximately 20 mV.

73. The method of claim 68, wherein there is fUrther provided the step of reducing the rate at which said step of delivering a plurality of predetermined amounts of a standard solution is performed.

74. The method of claim 68, wherein said step of extrapolating comprises the step of extrapolating a plurality of the measured electrode potential values back to the point of zero analyte concentration.

75. The method of claim 68, wherein in said step of delivering the plurality of predetermined amounts of the standard solution having a known concentration of analyte, the concentration of the analyte in the standard solution is high relative to the concentration of the analyte in the chemical solution having the first chemical composition that has been delivered to the analysis cell, whereby dilution of the chemical solution having the first chemical composition is reduced.

Please cancel claims 76-77.

76. (Cancelled) A fitting for coupling tubing, the fitting comprising: